

IN THE CLAIMS

Please amend the claims as follows:

Claims 1-52 (Canceled).

Claim 53 (Currently Amended): A projection optical system guiding and projecting a light beam from a projected object surface onto a projection surface in an upstream-downstream direction through a transmission dioptic system and a reflection dioptic system of one or two reflecting mirrors, wherein:

the transmission dioptic system includes a plurality of transmission refractive elements;

substantial telecentricity is provided from the projected object surface up to a first surface of the transmission dioptic system;

an intermediate image surface of the projected object surface is positioned closer to the reflection dioptic system than to the transmission dioptic system, and an intermediate image on the intermediate image surface is formed as a normal final image on the projection surface via the reflecting mirrors;

the reflecting mirrors include at least one anamorphic polynomial free-form surface having different vertical and lateral powers;

a light beam from the reflection dioptic system to the projection surface is guided at an angle to a normal of the projection surface; and

the transmission dioptic system is decentered with respect to a normal of the projected object surface, and the transmission refractive elements of the transmission dioptic system are prevented from being decentered with respect to each other.

Claim 54 (Original): The projection optical system as claimed in claim 53, wherein:

the reflection dioptic system includes first and second reflecting mirrors arranged in an order described from upstream to downstream on a downstream side of the transmission dioptic system;

the intermediate image surface of the projected object surface is positioned between the first and second reflecting mirrors; and

the first reflecting mirror includes an axially symmetric reflecting surface having negative power, and the second reflecting mirror includes an anamorphic polynomial free-form surface having different vertical and lateral powers.

Claim 55 (Original): The projection optical system as claimed in claim 53, comprising an anamorphic polynomial free-form surface having different vertical and lateral powers in the transmission dioptic system as a part correcting an aspect ratio of the intermediate image of the projected object surface.

Claim 56 (Original): The projection optical system as claimed in claim 53, wherein an NA in the transmission dioptic system is greater on an upstream side thereof than on the downstream side thereof.

Claim 57 (Original): The projection optical system as claimed in claim 53, wherein the intermediate image surface is tilted and curved with respect to a principal ray of a light beam emitted from a center of the projected object surface.

Claim 58 (Original): The projection optical system as claimed in claim 53, wherein a principal ray emitted from a center of the projected object surface and a principal ray emitted

from a margin of the projected object surface are parallel to each other in a last surface of the transmission dioptric system.

Claim 59 (Original): The projection optical system as claimed in claim 53, wherein magnification of the intermediate image falls in a range of 1 to 5.

Claim 60 (Original): The projection optical system as claimed in claim 53, wherein magnification of projection is 40X or higher.

Claim 61 (Original): The projection optical system as claimed in claim 60, wherein an angle of projection to the projection surface is 5° or greater.

Claim 62 (Currently Amended): A projection optical system guiding and projecting a light beam from a projected object surface onto a projection surface in an upstream-downstream direction through a transmission dioptric system and a reflection dioptric system of one or two reflecting mirrors, wherein:

the transmission dioptric system includes a plurality of transmission refractive elements;

substantial telecentricity is provided from the projected object surface up to a first surface of the transmission dioptric system;

an intermediate image surface of the projected object surface is positioned closer to the reflection dioptric system than to the transmission dioptric system, and an intermediate image on the intermediate image surface is formed as a normal final image on the projection surface via the reflecting mirrors;

the reflecting mirrors include at least one anamorphic polynomial free-form surface having different vertical and lateral powers;

a light beam from the reflection dioptic system to the projection surface is guided at an angle to a normal of the projection surface; and

the transmission dioptic system is decentered with respect to a normal of the projected object surface, and the transmission refractive elements of the transmission dioptic system are prevented from being decentered with respect to each other at a group unit level.

Claim 63 (Original): The projection optical system as claimed in claim 62, wherein:

the reflection dioptic system includes first and second reflecting mirrors arranged in an order described from upstream to downstream on a downstream side of the transmission dioptic system;

the intermediate image surface of the projected object surface is positioned between the first and second reflecting mirrors; and

the first reflecting mirror includes an axially symmetric reflecting surface having negative power, and the second reflecting mirror includes an anamorphic polynomial free-form surface having different vertical and lateral powers.

Claim 64 (Original): The projection optical system as claimed in claim 62, comprising an anamorphic polynomial free-form surface having different vertical and lateral powers in the transmission dioptic system as a part correcting an aspect ratio of the intermediate image of the projected object surface.

Claim 65 (Original): The projection optical system as claimed in claim 62, wherein an NA in the transmission dioptric system is greater on an upstream side thereof than on the downstream side thereof.

Claim 66 (Original): The projection optical system as claimed in claim 62, wherein the intermediate image surface is tilted and curved with respect to a principal ray of a light beam emitted from a center of the projected object surface.

Claim 67 (Original): The projection optical system as claimed in claim 62, wherein a principal ray emitted from a center of the projected object surface and a principal ray emitted from a margin of the projected object surface are parallel to each other in a last surface of the transmission dioptric system.

Claim 68 (Original): The projection optical system as claimed in claim 62, wherein magnification of the intermediate image falls in a range of 1 to 5.

Claim 69 (Original): The projection optical system as claimed in claim 62, wherein magnification of projection is 40X or higher.

Claim 70 (Original): The projection optical system as claimed in claim 69, wherein an angle of projection to the projection surface is 5° or greater.

Claim 71 (Currently Amended): An image projection apparatus magnifying an image displayed on a projected object surface and projecting the magnified image on a projection surface by a projection optical system, wherein:

the projection optical system guides and projects a light beam from the projected object surface onto the projection surface in an upstream-downstream direction through a transmission dioptric system and a reflection dioptric system of one or two reflecting mirrors;

the transmission dioptric system includes a plurality of transmission refractive elements;

substantial telecentricity is provided from the projected object surface up to a first surface of the transmission dioptric system;

an intermediate image surface of the projected object surface is positioned closer to the reflection dioptric system than to the transmission dioptric system, and an intermediate image on the intermediate image surface is formed as a normal final image on the projection surface via the reflecting mirrors;

the reflecting mirrors include at least one anamorphic polynomial free-form surface having different vertical and lateral powers;

a light beam from the reflection dioptric system to the projection surface is guided at an angle to a normal of the projection surface; and

the transmission dioptric system is decentered with respect to a normal of the projected object surface, and the transmission refractive elements of the transmission dioptric system are prevented from being decentered with respect to each other.

Claim 72 (Original): The image projection apparatus as claimed in claim 71, wherein the image projection apparatus is of a front projector type.

Claim 73 (Original): The image projection apparatus as claimed in claim 71, wherein the image projection apparatus is of a rear projector type, comprising a folding mirror folding back an imaging optical path.

Claim 74 (Currently Amended): An image projection apparatus magnifying an image displayed on a projected object surface and projecting the magnified image on a projection surface by a projection optical system, wherein:

the projection optical system guides and projects a light beam from the projected object surface onto the projection surface in an upstream-downstream direction through a transmission dioptric system and a reflection dioptric system of one or two reflecting mirrors;

the transmission dioptric system includes a plurality of transmission refractive elements;

substantial telecentricity is provided from the projected object surface up to a first surface of the transmission dioptric system;

an intermediate image surface of the projected object surface is positioned closer to the reflection dioptric system than to the transmission dioptric system, and an intermediate image on the intermediate image surface is formed as a normal final image on the projection surface via the reflecting mirrors;

the reflecting mirrors include at least one anamorphic polynomial free-form surface having different vertical and lateral powers;

a light beam from the reflection dioptric system to the projection surface is guided at an angle to a normal of the projection surface; and

the transmission dioptric system is decentered with respect to a normal of the projected object surface, and the transmission refractive elements of the transmission dioptric system are prevented from being decentered with respect to each other at a group unit level.

Claim 75 (Original): The image projection apparatus as claimed in claim 74, wherein the image projection apparatus is of a front projector type.

Claim 76 (Original): The image projection apparatus as claimed in claim 74, wherein the image projection apparatus is of a rear projector type, comprising a folding mirror folding back an imaging optical path.